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As one of its major activities in carrying out its purpose, the Society publishes a monthly magazine, the Canadian Geographical Journal, which is devoted to every phase of geography—historical, physical and economic—of Canada, of the British Commonwealth and of the other parts of the world in which Canada has special interest. It is the intention to publish articles in this magazine that will be popular in character, easily read, well illustrated and educational to the young, as well as informative to the adult.

The Canadian Geographical Journal will be sent to each member of the Society in good standing. Membership in the Society is open to any one interested in geographical matters. The annual fee for membership is three dollars in Canada.

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Vacation Days

CANADIAN GEOGRAPHICAL JOURNAL

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Old Crow's Village

by

DOUGLAS LEECHMAN

OLD CROW is the most remote village on the mainland of Canada, almost literally at the ends of the earth.

There are several ways of getting there, none of them quick or convenient. From Vancouver you may, as I did, take the Canadian Pacific Steamship *Princess Louise* as far as Skagway and go by train from there to White Horse in the southern part of Yukon Territory. Thence a comfortable stern-wheeler will carry you down the mighty Yukon River to Dawson, filled with memories of '98, and on—across the border into Alaska as far as Fort Yukon, a few miles north of the Arctic Circle.

So far it has been a pleasure cruise, familiar to hundreds of tourists who come to see the midnight sun in late June, but at this point the tourists gladly drop out of the running. Here, at Fort Yukon, the Porcupine comes in from the northeast and it is up this river that you must travel, three hundred miles, to reach the village of Old Crow. The only way to get there, unless you fly, is in an open, gas-engined boat, and the journey upstream is long and slow.

Above Fort Yukon the Porcupine twists and meanders its way slowly through the Yukon Flats till it reaches a series of long, canyon-like valleys lying between abrupt cliffs known as The Ramparts.

Here the scenery is spectacular, the brightly coloured rocks rising almost vertically from the narrow shore of the river. Jagged spires tower three hundred feet

The beginning of The Ramparts of the Porcupine River.

Photographs by the author—reproduced by courtesy of the Department of Mines and Resources

Left:—Mrs. Lazarus, using a beaded baby-belt.

New Rampart House

above the water, reds, yellows, browns, blacks, and whites, banded and splotched, some trickling with water, others ranged in stiff basaltic columns.

Every now and then the hills fall back to more gentle slopes covered with grass, and their flanks will be all seamed with a hundred criss-cross trails, marking a "caribou-crossing" where, for untold centuries, the caribou in their annual migrations cross at a spot where the hills are not too steep to climb and the river shallow enough to ford.

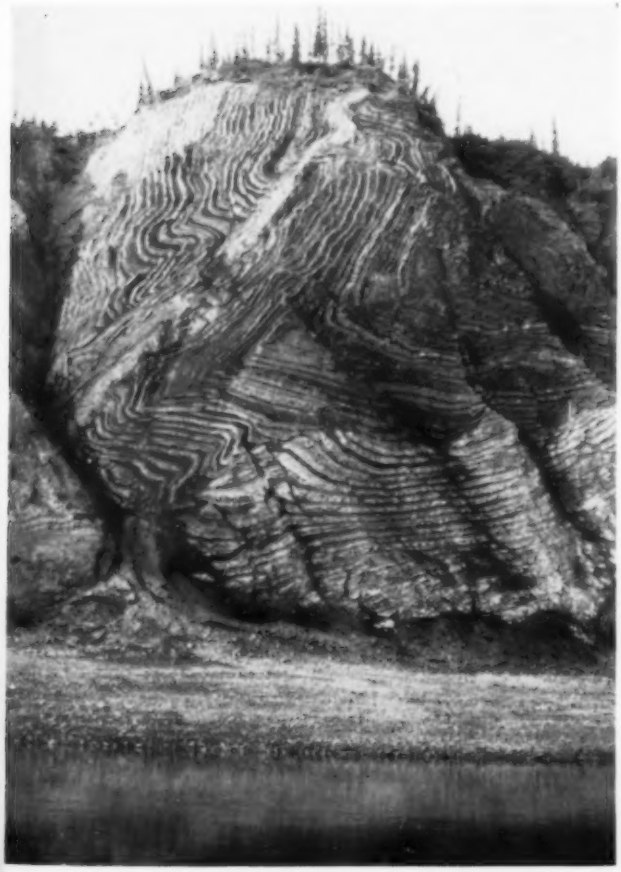
The Indians know every one of these crossing places and have thrilling tales to tell of the old days when they hunted the caribou there in the native way, and the men would push out their canoes into the herds of wading, swimming animals, killing as many as they could with their bone-tipped lances.

About fifteen miles east of the 140th meridian the Old Crow River, flowing from the north, joins the Porcupine and the village lies on its north bank, about a mile below the point of confluence.

A hundred and twenty miles to the north lies the Arctic Ocean. Eighty miles to the south is the Arctic Circle. The way up river leads, by McDougall Pass, to the valley of the Mackenzie River and Aklavik, something over a hundred and fifty miles to the east. There are no permanent settlements nearer than these, only an occasional trapper's cabin on some lonely river bank.

The village itself lies on a flat between the river and the Old Crow Hills to the north, their lower slopes heavily timbered with spruce, their summits covered with brush and open meadows, the home of grizzly bears.

A few acres of the flat have been cleared to make room for the houses, and for some distance round the trees have been cut for firewood, so that each year the people have to go farther afield to obtain the many cords of wood needed during the long, cold winter.



Banded black and white sediments on the Porcupine River, known to the Indians as "Moose Guts".

Rocky spires and turrets in The Ramparts.

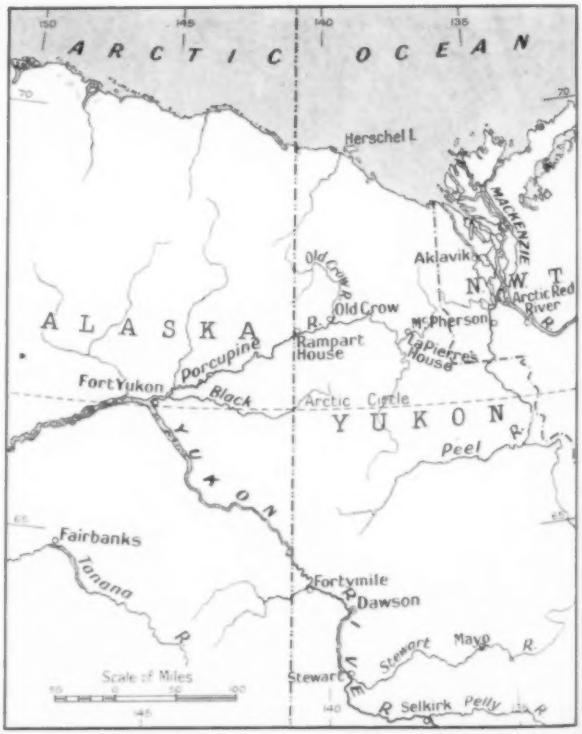
This flat, on which stands the village, is an alluvial bank of silt and fine gravel, deposited by the Porcupine when it was a younger stream. Today the river lies some thirty feet below the top of the bank and all water has to be carried up the almost vertical face of it by a trail which cuts diagonally down to the gravelly shore. Water for drinking, for washing, for cooking, for the dogs, all of it has to be carried; pumps, I was informed, proved unsatisfactory, especially in winter. Fortunately it is good water, clear and cold, except when the spring floods bring down quantities of silt.

Climate

The climate, as one might imagine, is continental. The winters are long, seven months or more, and the summers, though short, are delightful, with fine, sunny days, cloudless skies and long, cool nights, when the sun hardly sets at all.

In June, since one is north of the Arctic Circle, the sun dips low behind the Old Crow Hills to the north, and would not set at all were the true horizon visible. The winters are not only long but cold, many degrees below zero every year, often going to sixty or even seventy below for a few days. Forty below is "mild" and everybody enjoys it keenly, for then conditions for travelling by dog team are ideal. Spring and autumn are "between seasons", apt to be wet and chilly.

Snow may come at any time of the year, for even in mid-summer a cold day may bring a brief flurry of snowflakes and a cutting wind. In 1946, according to unofficial observations, the last spring frost was on the 25th of June and the first autumn frost on the 25th of July, though the weather had been mild enough for some weeks before and after. There may even have been light frosts between those dates and, though there



Canadian Geographical map

The trail from the shore to the top of the bank at Old Crow.

was not much of it, snow fell on the latter date.

During the summer, the horizon is often hazy with smoke from forest fires. All along the river banks may be seen the effects of fires. There will be a whole hillside covered with a stand of spruce, lighter in colour than the rest of the forest, owing to their being younger. Other patches will still show the charred and blackened stumps standing among the new growth, not yet tall enough to hide them.

In the summer, inevitably, come the "flies", a term which includes mosquitoes, "bull-dogs" or "deer-flies" (Tabanids), black flies, and "no-see-'ums" (Culicoides). They come in countless millions, ravenous for blood, importunate, insistent. In the Old Crow Flats, an area of swamp and lakes a few miles up the Old Crow River where muskrats abound, the flies are so numerous and so voracious that they have actually killed sleigh dogs and the Indians tell tales of their killing even grizzly bears on their journeys from one hillside to another. The bears, in crossing a swampy river valley, are bitten about the eyes till they can no longer see and then they stumble into quagmires from which the tormented beasts are quite unable to extricate themselves.

History

Old Crow should really be Old Raven, for there are no crows in that part of the Yukon and ravens, which are quite common, are usually called crows. Years ago there was a well-known chief whose name

The village of Old Crow from up the Porcupine. The Old Crow Hills are in the background.

Chief Peter Moses in his official cap.

was Old Crow and who made the Old Crow River his headquarters. Now Old Crow's River, the Hills, and the village all take their name from him.

The present village was formed about 1912, but there have been Indians, the ancestors of the present inhabitants, in the vicinity much longer than that, just how long nobody knows. The point where the Old Crow River joins the Porcupine is known to the Indians as Fish Trap Place because they once had a permanent fish weir there, and traces of old dwelling-places are to be seen there as well as a few miles farther up the Porcupine.

Even farther up, and more likely to be found on your map than is Old Crow, stood LaPierre's House, now abandoned, as is Rampart House, down the Porcupine a few miles and just on the Canadian side of the Alaska-Yukon boundary. It was moved here after both Fort Yukon and Old Rampart House had been shown to be on the wrong side of the line.

As far as we know, John Bell, an employee of the Hudson's Bay Company, was the first white man to descend the Porcupine to its mouth, passing the present site of Old Crow as he did so. That was in 1844, and the following year he came again and brought his wife with him. Those indeed were the days of pioneers. He came by way of the Rat River, later made famous by the "Mad Trapper of Rat River", and he it was who established Fort Yukon as a trading post.

The People

There are ten or fifteen white residents of Old Crow, including the Royal Canadian Mounted Police officers, a trader and his family, and a few trappers who spend their summers there. There is no missionary and no school teacher. One of the white men, a retired trader, has the only cat in the village, an unhandsome but kindly animal named Tabitha, whose life is in constant peril from the dogs.

The Indians are the Vanta-kutchin, the "people of the lakes", a branch of the Loucheux tribe. The lakes referred to lie in the Old Crow Flats, a few miles up the river. There are about a hundred and thirty-five Indians in Old Crow, their numbers varying from time to time. Their nearest relatives are in three groups: at Fort McPherson in the Mackenzie River valley; on the Black River, a tributary of the Porcupine farther downstream; and at Fort Yukon.

All these people speak dialects of the same language and their speech is mutually intelligible, though they are conscious of minor

Balaam Jhudi and his wife, Sarah.

variations. Some are intermarried with Eskimos at Aklavik; others are connected with even more distant groups of Indians, such as those at Eagle, and at Chandalar, and about the headwaters of the Peel River.

These people are among the finest of their race in Canada. They are forthright and self-confident, kindly, generous, intelligent, and honest. Though by no means well-to-do from our standpoint, they collected over $450 for the relief of children who had suffered in the bombing of London. The money was most thankfully received and a special radio broadcast was arranged so that the Indians of Old Crow could actually hear the gratitude expressed by the children they had benefited. Later some of the children wrote letters of appreciation and these are carefully preserved, with other documents, in care of the Chief, Peter Moses.

Many of the Indians have had biblical names conferred upon them by missionaries, in addition to their own native names, so we meet such people as Balaam, Moses, Peter, Paul and, among the women, Rachel, Sarah, and Mary.

In the old days, many of the more able men had several wives and there are still isolated cases of plural marriages in some parts of the country.

There seem to be two distinct ethnic strains among the people here and they, themselves, are aware of this. Those who trace their origin to the interior of the northern Yukon and the headwaters of the Peel River are in general darker in complexion and heavier in build than are those who come from nearer the Arctic coast to the north, or from the Chandalar district to the west.

As a whole, they are not markedly Indian in appearance, nor have they so Mongolian a cast as have the Indians of the British Columbia coast, for instance. The children certainly are more Asiatic in appearance, with large dark eyes, straight black hair, and beautiful colouring. They are singularly charming and attractive little people and their parents show great love for, and kindness to, them.

All children adore pups, including Indian children.

The sturdy independence of the people may be attributable, in some part at least, to the fact that they are not restricted to reservations but live much as they always did. They know that many other Canadian Indians do live on reservations and are most anxious to avoid such a life themselves.

Today most of the people of thirty or less speak quite good English. Although there is now no teacher at Old Crow, many of them have been to school at other places, such as Carcross or Dawson, and some of them read and write English with considerable fluency. The older generation is less accustomed to the white man's language and has had less occasion to use it. A few traces of a Scotch accent are retained, acquired from early Hudson's Bay Company traders. They speak of Rampart "Hoose", and sometimes answer "Aye!" instead of "Yes!".

They are quite aware of their past history and speak with pride of well-known men among their ancestors. Prominent in this group is Sha-ni-yuti, a famous man whose portrait appears in Richardson's account of his travels in search of the lost Franklin

Margaret Black Fox, ageing but still active.

expedition. Sha-ni-yuti had ten wives and was well known all up and down the Yukon. Many tales are told of him, including accounts of his generous distribution of food, even when he had barely enough himself. "Never was his belly tight", I was told. Many early travellers met him, and his descendants are numerous. One of them, David John, was drowned in the Yukon River in 1946, and I flew from Fort Yukon to Fairbanks with a great-grandson of his, who was then wearing a United States Army uniform.

Among the most delightful of the Indians are the old people. Shrewd, kindly, philosophical, they have all the serenity and dignity imaginable. One of them, Margaret Black Fox, who speaks no English, was living alone in a little tent when I was there. Daily, as I passed nearby, I would wave to her, and she would smile and wave in return. One day she stopped me, and calling to Julius Kendi, the native clergyman, who was passing, asked him to act as interpreter.

"Tell him," she said, "that I am glad when he waves to me and smiles as he passes, for I know that he is connected with the government and is therefore a representative of the King. When I get the rations which are given me, because I am old and poor, I say, 'Thank you, my God, and thank you, my King', and when I see him going by, I feel it is as though the King himself had sent somebody to see that all was right with his people in Old Crow."

Native dress, once handsome, is never seen today. Buckskin clothes, heavily beaded and painted, ornamented with the prized dentalium shells, were once the dress used on ceremonial occasions, with simpler garments for more ordinary days. Now the men wear overalls and caps, the younger fellows gay in smart leather windbreakers, with zippers and patch pockets. The women wear undistinguished skirts and bodices with a shawl over their heads. Only the moccasins are retained, and even these are not worn by some Indians who have been 'outside' and have become accustomed to the white man's ways.

"Steamboat", an elderly Loucheux Indian of Old Crow.

Main Street, Old Crow.

Better style of log cabin, but lacking a storm porch.

The Women's Auxiliary outside their hall.

Houses

Nearly all the houses in Old Crow are log cabins, built from locally cut spruce. They are warm in winter, cool in summer, and inexpensive to build and maintain. The windows are, as a rule, small and few since they have to be imported and their weight and fragility tend to make them expensive. In summer, tents are used to some extent and even far into the cold weather in cases of necessity.

A few feet below the surface, the ground is permanently frozen, and provides excellent cold storage, A cellar is dug below the house, down in the permafrost, and the temperature can be kept low enough to ensure the preservation of vegetables and canned goods indefinitely. A few feet lower, and meat will freeze hard, so that an autumn supply of caribou and moose may be laid in which keeps fresh and good as long as there is any of it left.

Outside the front door, usually the only door, of most cabins is a storm porch which serves as a place in which to hang heavy outer garments in winter. Here, too, are stacked several armfuls of firewood, and such things as rifles, snowshoes, and a few traps hang from pegs or nails. The storm porch serves also to protect the door itself from the direct onslaught of the weather.

Lighting is, for the most part, by means of coal-oil lamps' There are three wind-powered generators in the village which supply a somewhat inadequate amount of current. Several of the whites and some Indians have battery radios, usually not in very good order, and which are of use chiefly for news reports and notice of local plane flights.

Food

Among the native sources of food, the caribou easily comes first. Particularly towards the end of August, when the annual migration may be expected, all eyes are turned to the summits of the Old Crow Hills. Here the people hope to see the caribou, silhouetted against the sky-line, far away and so small as to be hardly distinguishable. It is a proud distinction to be the first to see them and the discoverer will raise a long-drawn cry of "Wutzai!" Then everybody who is able will seize his or her rifle and take the narrow trail leading up through the spruce to the comparatively open bush of the hill tops.

The caribou normally reach the Old Crow River at a crossing place a few miles upstream from its mouth and thence cut across country to another crossing, about fourteen miles above Old Crow, which takes them to the south side of the Porcupine. Both of these crossing places were the scenes of great annual hunts in the old days.

Fish are caught in nets which are set in the river, one end floating free or moored to a stone let down to the bottom. The principal kinds secured are salmon, jackfish, grayling, inconnu, and whitefish. Today the nets are made of twine, netted by the people themselves, but they used to be of willow bast, and the spinning and tying of the brittle fibre had to be done under water to keep it sufficiently flexible. Such a net was good for one season or, with care, perhaps for two.

Fish nets have to be inspected daily or oftener, to take any fish which may have been caught, and to free the nets of driftwood which might otherwise drag them away downstream. Sometimes a rise or fall in the water, which takes place often and quickly, will necessitate shifting a net to a new place. Nearly everybody has a net set at all times except when the river is frozen, and the daily inspections are a tedious, but necessary, chore.

Fish traps and weirs used to be made of willow and birch stakes driven into the river bed in comparatively shallow places, still well remembered, and one may find today, lying on the nearby shore, the hammer-like stones which were used for driving the stakes.

Rabbits, (really arctic hares), are also a source of food and are caught in snares, expertly set by the women and girls. The fluctuation of the rabbit population is a well-known phenomenon in the North and it has much to do with the supply of this

Inside view of a Loucheux canoe.

"Steamboat" killing a salmon just taken from his net.

Type of freighting barge used on the Porcupine River.

Scraping a moose hide to make it clean and soft.

kind of food. In the old days, a poor rabbit year might easily mean starvation.

Porcupines are eaten freely by the natives, and so are moose though they are not very numerous. Black and grizzly bears are eaten also, and on occasion a polar bear will wander down from the north coast, going even as far as the headwaters of the Porcupine River where one was shot a few years ago. Another was killed near Old Crow in 1946 and I saw its hide drying on a clothes-line outside one of the cabins. In 1942, yet another was shot in the Old Crow Hills a few miles from the village.

Vegetable food is confined to berries and a few edible plants, not much used by the Indians. The white people have small gardens in some cases, but the growing season is short and uncertain and all the water has to be carried up from the river. As there is so little rain in summer, this means a lot of work, but the lettuce, radishes, and potatoes they are able to grow are very welcome additions to the menu.

Transportation

Transportation is one of the more serious problems in all remote areas, and Old Crow is no exception to the rule. In the summer, when the river is open, supplies come in by boat from Fort Yukon. Although the lower part of the Porcupine River is slow and meandering, once The Ramparts are reached, the river becomes a succession of calm stretches interrupted by riffles which are often steep enough to make ascent difficult.

The preferred type of boat is a shallow draught craft about fifty feet long and eight wide, resembling a "sturgeon" boat, and powered with a gas engine. Such a boat often pushes another of the same type in front of it. Under normal conditions the trip up from Fort Yukon takes a little less than a week. The trip down has been done in two days. When the water is low, as it well may be at the end of summer, many delays are experienced and at times all boat traffic is brought to a standstill.

Such boats as these, however, were introduced by the whites. The native canoes are much smaller, only eight or ten feet long and barely two feet wide. Except that they are not covered in, they strongly resemble an Eskimo kayak in appearance, but differ from it in construction. They are canvas covered and are propelled by means of a narrow, single-bladed paddle, and are singularly easy to manoeuvre—and to upset!

Hut for smoking moose or caribou skins.

Perishable goods and urgently needed supplies are brought in by aeroplane, summer or winter. In summer, landings are made on a gravel bar, a few hundred yards up the Porcupine River. This means that a boat has to be sent out to meet the plane and fetch both passengers and goods.

In winter, a plane fitted with skiis can come down on a little lake that lies behind the village.

Air freight rates from Fairbanks run to as much as twenty-five cents a pound, which brings the prices of commodities up considerably.

In winter dog teams are the principal means of transportation, but they seldom undertake very long trips. They are used by traders and trappers, by Indians and whites alike, for hauling wood and for visiting trapping cabins. The cost of maintaining a dog team is high, whether in money or in work. In money, commercial dog foods, such as cereals, edible tallow, and dried fish, have to be imported. In work, the owner of the dogs has to hunt meat for them, which can entail the expenditure of a great deal of time and energy. When one remembers that there are usually at least five dogs to a team, the cost is easily seen to be high indeed.

Yet the dogs are an important factor in the scheme of things. Throughout the summer, they are kept tied up, for they would otherwise be into all kinds of mischief. They are fed but little and spend the long days fighting off mosquitoes and dozing, or striding restlessly up and down as far as their chains will let them. Occasionally all the dogs, and there must be at least two hundred of them, howl together. Old dogs and puppies, big dogs with deep voices and small ones with high voices, blend into a soul-stirring chorus which raises the hair on the back of one's neck. Once heard, it is never forgotten, and there is no sound in civilization more apt to bring back memories of the North in a nostalgic flood than the howl of a dog.

Many of the local sleigh dogs are crossed deliberately with wolves or coyotes. The first cross, or half-breed, dog is hard to manage and short in temper, especially when tired, and is considered less desirable as a sleigh dog than the second generation, or quarter-breed dog, which has only one quarter wolf or coyote blood in his veins.

Trails

Throughout the Yukon Territory and, indeed, the whole of Alaska too, are innumerable Indian trails, made many years before the white man reached the country. They run beside the rivers, along the lakes, on the high ridges and over the low passes, from one Indian settlement to another. Many of them are still in constant use and have been known and travelled for centuries. Modern roads in the south of the Yukon, including the Alaska Highway, often run for many miles parallel with old trails made, in all probability, not long after man first crossed Bering Straits and penetrated into North America.

Commerce

Exports and imports play a large part in the life of Old Crow, for most products have to be imported and paid for by means of exports, chiefly fur. Almost the only com-

Three-quarters dog, one-quarter coyote.

The Rev. Julius Kendi.

modities produced locally are firewood and wild meat, including caribou, moose, bear, rabbits, and fish. Everything else has to be brought in, all other food, clothing, house furnishings, hardware, liquid fuel, medicines, and all the hundreds of other articles which are in daily use.

Trapping is the principal industry, with enough hunting to secure meat and fish. Muskrats are the fur most easily obtained and, in the spring ratting season, whole families engage in the hunt. A good trapper with an active family can secure a thousand rats and more with no great difficulty and in recent years they brought three dollars or more each. Even youngsters in their early teens can thus add several hundred dollars to the family income. During the winter, when furs are prime, other animals are trapped, including fox, mink, marten, lynx, and wolverine.

In good fur country, trapping is a profitable occupation, but it is a hard life and a lonely one, unless a man takes his whole family with him as some do. Then they divide up into twos, each pair running a different trap line, and one couple taking its turn at staying at home to look after the cooking and to skin and stretch furs. Though the winter is long and cold, there are after all only a few days when it is actually too cold to travel and then one very gladly stays indoors till the weather changes.

For the women, one of the principal occupations is the preparation of caribou and moose skins. Nearly every day one can see them being smoked in little shelters built over a pit in which rotten wood smoulders, and the swish, swish, swish of the skin scrapers is a constant sound in the village. The skins are used for making moccasins, for bags and belts, and for many other purposes.

There are two stores in Old Crow. The larger one is owned and operated by the

The altar with its bleached and embroidered moose skin.

Northern Commercial Company which has many branches in Alaska and several in Yukon Territory. The smaller store is operated by a native trader who, though he carries less in stock, does a good business.

There were other traders here in earlier days but they all have either sold out or left the district.

Most of the fur catch comes into the stores in the spring and is sent down river in the summer. In 1946, I saw one shipment which, I was told, consisted of sixty-one bales of fur, including fifteen thousand muskrats.

Some years ago, another export was beadwork, chiefly in the form of moccasins and the wide belts used by the women for carrying children on their backs. The women of Old Crow are famous for their skill in this work and there is a constant demand for it, not only from other Indians but also from souvenir shops catering to the tourist trade. Beads have been difficult to obtain recently and some women were recovering them from old pieces of work so that they might make new ones. The moccasins, when heavily beaded, sell for twenty-five dollars a pair in Old Crow and the belts bring fifty. When they are offered to tourists in Fairbanks or White Horse, they bring a good deal more.

As most supplies come in by way of Fairbanks or Fort Yukon, both of which are in Alaska, they are subject to customs duty, which is collected by the Royal Canadian Mounted Police.

In the old days, when the natives alone lived in the northern Yukon, annual trading trips down the river were eagerly looked forward to. The Old Crow people traded caribou skins and dried fish for canoes made of birch bark, made in the Black River country, and shafts for spears, made from tough birch. Nowadays the fish travels in the opposite direction, being freighted in to Old Crow in odoriferous bales for dog feed.

Communications

Communication with the outside world does not depend solely on people going down river to Fort Yukon, where the nearest accessible post office is, for there is a short-wave radio telephone in the Mounted Police office which civilians may use for the sending and receipt of messages for set fees. Carrying mail to Old Crow is purely a courtesy service. If a plane bound for there stops at Fort Yukon, the pilot may be asked whether he would care to take in some mail. Whether he does so or not is his affair. He is not required to, nor is he paid to. When a boat starts its trip up river, the owner may be asked to carry the heavier mail and parcel post. Again, the option of refusing is his, though nearly everybody is only too glad to do so, since his own letters are likely to be included in it.

Most letters leaving Old Crow are carried to Fort Yukon, where they are prepaid with United States postage stamps and carried by the regular U.S. mail from there.

Social Services

In Old Crow, social services are undertaken by the Church of England. At one time there was a missionary and his wife there, but they have gone and had not been replaced at the time of my visit. The Rev. Julius Kendi, an ordained minister, arrived during the summer to act as pastor to this flock. He had as his assistant a local man,

The Anglican Church, Old Crow.

Joe Kay. Mr. Kendi is a well-educated Loucheux Indian, who types his letters, and can preach his sermon in his native tongue or in somewhat halting English. He is most reverent and devout and an admirable clergyman.

Prominent among the church's social activities is the Old Crow Anglican Women's Auxiliary, made up of local native women, who form a group just as active in good works as any of their sister organizations in other parts of Canada.

The church itself is a log building with a steeple surmounting the front porch and housing a bell which is rung to call the congregation to worship. There is a small vestry to one side near the back of the building and here are kept the church vestments and the consecrated vessels.

One of the chief ornaments of the church is an altar cloth of snowy white moose skin, tanned by the local women, and most intricately decorated with floral designs in beads. It is a very handsome piece of work and one of which the whole village is justly proud. A similar altar cloth is to be seen in the church in Fort Yukon.

Half a mile or so behind the village lies the graveyard, on a little gravel ridge. It is not at all an old graveyard, in fact the earliest date I remember was 1913, but it is already far too full, and far too many of those buried there are children. Some of the graves are surrounded by neat little picket fences, painted white, and wreaths of artificial flowers are laid against the simple gravestones, most of them no more than wooden crosses or slabs bearing the names, dates, and ages of those lying beneath. A few small birch trees stand nearby and these are marked with a cross cut in the white bark to delimit the boundaries of the consecrated ground.

At the time of my visit there was no school and no qualified medical officer. Serious cases are flown out to Fort Yukon or Aklavik where there are hospitals; minor cases are treated by the patient's family or by the police. The commonest serious illness appears to be tuberculosis, which strikes many children in their early teens. Colds, and dermatitis, the latter probably attributable to dietary deficiencies, are the more common minor ailments. The good teeth of most of the Indians are particularly noticeable.

Amusements

There is little in the way of organized amusements, though dancing is a favourite winter occupation and a number of Indians can play the fiddle acceptably. The Christmas fancy dress ball calls forth exceptional ingenuity and is talked about for months afterwards.

In the long summer evenings, the people like to sit out in front of their houses, overlooking the blue waters of the Porcupine spread below them, smoking and chatting quietly, watching the children at their interminable running, wrestling, and jumping. There are boats coming and going, somebody may be seen starting out to examine his fish nets, a plane may pass overhead on its way to Fort Yukon or Aklavik, always there is something to see, something to speculate about.

Although Old Crow is so remote and its people so little affected by the white man's way of doing things as compared with their brethren nearer civilization, yet it can hardly be expected that this will always be so. Inevitably a change will come, and we can only hope that it will be a beneficial one.

FLOWER SERIES — Part I

Photographs and Notes by W. V. CRICH

WHITE WATER LILY — *Castalia odorata*

THE white pond lily is well known to most people. Its large white or pinkish petals, its rich golden stamens and its dark green lily-pads make it an irresistible subject for artist and photographer. The leaves are a rich green on the upper side and pinkish underneath. They are nearly round and cut at the base as far as the junction of the leaf and the stem.

This lily blooms from June to September in ponds and slow-moving streams of eastern North America. Of all the water plants it is the one most favoured by the myriad insect population that infest the slow-moving waters where it is found. The flowers, often five inches in diameter, are open only for a brief interval during the day. They generally open soon after the morning sun reaches them and remain open only until noon or early afternoon. During this short interval the neighbouring atmosphere is filled with their pungent sweet odour.

Water lilies are perennials arising from large rhizomes as thick as a man's arm, embedded in the black muck of the river bottom. These large fleshy underground stems make excellent food for muskrats. For this reason, muskrat farmers prize these food plants and look after their requirements and propagation just as "dry" farmers care for their corn or tomatoes. Lily-pads also constitute one of the main sources of food for the moose of the northern lakes and rivers.

HYBRID YELLOW LADY'S SLIPPER — *Cypripedium parviflorum*

THE accompanying photograph shows a hybrid form of the Smaller Yellow Lady's Slipper. The only difference between this and the common one is in colour—white in this flower replaces the yellow of the commoner form. The bright white lip as well as the summit of the column is blotched or striped with magenta.

This specimen was photographed at Turkey Point, Ontario, on Lake Erie. About a dozen others were seen in the wet bog bordering the lake. The Smaller Yellow Lady's Slipper was also common and found beside the hybrid.

The stem is leafy to the top; but while the Smaller Yellow Lady's Slipper has from one to three flowers, the specimens of the hybrid which we saw were all single-flowered.

The showy, fragrant white flowers, with their long narrow twisted petals, were difficult to find among the higher colonies of bog grasses and sedges. The clump pictured was, however, more favourably situated among delicate ferns, and "gardening" was unnecessary for photographing them to advantage. An overcast sky and diffused light made it possible to photograph this particular group without first shading it with a screen of white cheese-cloth. Contrary to general opinion, bright sunlight is not the best kind of light for flower photography. Bright sunlight causes too great a contrast between the shadows and the highlights. Although the human eye can observe and be conscious of such an extreme range of contrast, our photographic material is not so sensitive, and the scale of contrast must be compressed in order to get a satisfactory range of tones on the final print.

Flowering at the same time and in the same habitat is a variety of the Yellow Lady's Slipper which is characterized by its much larger flowers and by its greater height. This is known as the Larger Yellow Lady's Slipper. Except in size, the two are very similar.

The orchid family is a very large one, comprising several thousand different species. Most of these, however, are natives of the equatorial region. Many of them are epiphytes, or air-plants, deriving their support chiefly from the moisture of the air, through their long aerial roots, which hang down but never reach the ground.

In Canada few people realize that we have orchids among our native flora. They associate this name only with the exotic greenhouse variety. Although our representatives of this great order are not numerous, they are among the most interesting and beautiful of our wild flowers.

SHOWY LADY'S SLIPPER — *Cypripedium reginae*

THE Showy Lady's Slipper is the most beautiful of our native orchids. Like the other members of this family it is found in cool swamps and rich mossy woods. It never flaunts its beauty, for to do so would be disastrous. Few people can resist picking this belle of the woods, a flower that seems too exquisite to be found anywhere but in greenhouses. For this reason it is becoming rarer every year and only those who are willing to search diligently for its abode can see this plant in its native habitat.

The draining of our marshes has changed the habitat of this and many other bog plants. Unable to survive under the changed conditions, they have perished. Another cause of their diminishing numbers is their sale in many market places. This should be forbidden, because, even when dug up completely, their coarse fibrous roots cannot withstand the change in soil conditions, and within a year or two the plants are dead. For all these reasons patches of this flower are becoming harder to find. When one does find such a patch, the secret should be carefully kept, even from one's friends.

SHINLEAF — *Pyrola elliptica*

THE Shinleaf belongs to the wintergreen family, Pyrolaceae. The name is from Pyrus, a pear, in allusion to the shape of the leaf. Members of this family are generally evergreen perennials with running subterranean shoots, bearing a cluster of roundish basal leaves and a simple raceme of nodding flowers.

The flowers, greenish white and waxy, are extremely fragrant. Most plants which require cross-pollination depend upon insects as pollen carriers. Showy colours and flower odours serve to advertise the nectar or pollen which the flower has to offer to insect visitors. The acuteness of the sense of smell among insects is well known; ants soon discover a picnic. Many plants by their large flowers find it possible to attract as many insect visitors as they need without giving off any scent perceptible to us. Others with small flowers, like the shinleaf, are sweet scented to attract insects. Colours of flowers are a less important means of attraction than odours, because insects are extremely near-sighted. The chief insect visitors to the shinleaf are the bees and bee-like flies which alight on the extremely long and invitingly exposed pistil.

This is our commonest species of *Pyrola* and it may be found in rich woods from the latter part of June until August.

YELLOW DOG'S-TOOTH VIOLET; YELLOW ADDER'S TONGUE

Erythronium americanum

THE Yellow Dog's-tooth Violet belongs to the lily family, or Liliaceae. The family includes about sixteen hundred species, inhabiting chiefly the temperate and warmer regions of the earth. Many of the most pleasing and widely cultivated plants—for example, the tulip, hyacinth, and lily-of-the-valley—belong to this family. Also in this family are some vegetables, the onion and asparagus.

The Yellow Dog's-tooth Violet is well known to all naturalists and other outdoor hikers and enthusiasts throughout the eastern provinces of Canada and eastern sections of the United States south to Florida and Arkansas. It flowers in moist woods and thickets in April and May. For company it associates with our other spring flowers, the Hepatica, Spring Beauty, and Squirrel Corn.

This small, lily-like flower is easily recognized by its dull golden-yellow perianth. The leaves, two in number, are a dark glossy green mottled with brown and with a purplish tinge. The plant is propagated by offshoots from a deeply buried corm.

BIRD SERIES — Part I

RUBY-THROATED HUMMINGBIRD

Photographs and Notes by W. V. CRICH

ARCHILOCHUS COLUBRIS (Gk. *archi chief* + *loches* crowd)

THE Hummingbird is easily recognized by its small size and its needle-like bill. Large hawk-moths are often mistaken for Hummingbirds, but the moths visit the flowers at dusk, while the Hummingbirds feed only in the daytime.

The Ruby-throated Hummingbird breeds in the Prairie Provinces of Canada, in Ontario and Quebec, southward to the Gulf Coast and Florida. It spends the winter months from middle and southern Florida and Louisiana through to southern Mexico and Central America to Panama. It is the only Hummingbird found east of the ninety-fifth meridian.

While sitting by the edge of a woodland pool trying to get a Water Thrush to betray its nesting site to me, I heard the whirr of wings. A Hummingbird was collecting willow-down to line its felted nest. I followed it with my eye as far as possible and then stationed myself at this point and waited for its return for more down. I did not have long to wait, and successfully followed its return flight towards its nest another short distance. By repeating this process, I was able finally to locate the nest saddled on the limb of a cedar. Later in the year, I spent several interesting hours observing one of these birds in a patch of jewel weed. Close at hand was an alder tree with some dead branches. After feeding on the jewel weed, it rested on one of these dead

branches, preened its feathers and stuck its tongue right out, maybe to clean it. There was an adult female and an immature one. The young bird would sip nectar itself; but it still wanted to be fed by the mother, and would fly out to meet her and take its food on the wing.

I got a small bottle, dipped it in red enamel, and after it dried I filled it with sugar and water. This I tied by means of a string to some raspberry canes. Next morning it was empty. While examining the empty bottle, the Hummingbird flew angrily overhead. It resented my tampering with such a lovely flower. I refilled the bottle and set up the camera to take a picture. The camera did not bother the bird in the least, and after the first click of the shutter, when she flew over and examined the camera thoroughly, she just ignored it.

The family tie seemed to be definitely broken, as the mother bird guarded this bottle of sugar solution. She would not let her offspring near it, nor was she seen to feed the young bird anymore. When not feeding herself, she sat on guard up in the alder tree. The minute the sound of wings was heard, out of the tree she darted and chased the trespasser away, scolding and chattering in what seemed to me to be pretty strong language. She no longer visited the flowers. I took the bottle off the raspberry cane and tied it on the end of a stick about three feet long, which I held in my hand. When she had finished feeding at the bottle and went for a rest, I broke off a portion of the stick. This shortening of the stick was repeated until I was holding the bottle in my hand; and she continued to feed from it.

ROSE-BREASTED GROSBEAK

Photographs and Notes by W. V. CRICH

HEDYMELES LUDOVICIANUS (Lat. *hedymeles* a musician, from Gk. *hedys* sweet + *melos* singing; Lat. *ludovicianus* pertaining to Louis (Louisianian))

GROSBEAKS are easily recognized by the extremely large, short, stout, seed-cracking bill. The male is a pattern of black and white, with a beautiful triangular rose-red patch on its white breast. The female is streaked, and resembles a large Sparrow; but it is easliy identified by its wide, white wingbars, its white eye-line, and its large bill.

It breeds from the central parts of Manitoba, Ontario and Quebec southwards to Kansas, southern Missouri, central New Jersey and central Ohio and in the mountains to northern Georgia. It winters from Mexico and Yucatan to Ecuador and Venezuela.

Within a half hour's drive from the city of Toronto is a small wood which, for variety and number of species, is, I believe, unequalled anywhere. There I can always be sure of finding several nests of the Rose-breasted Grosbeak. It is a mixed wood with a clear and icy cold trout stream meandering through its depths—an ideal camping spot, where every morning around four o'clock the sweet, mellow song of the Rose-breast and the flute-like repertoire of the Wood Thrush (another woodland singer) waken you from your sleep.

The male Grosbeak, although so strikingly coloured, shares in the duties of incubation, and continues to sing on the nest as if it enjoyed having a share in the domestic duties. If danger approaches in the form of a Hawk, it continues to sing, but the volume is reduced and seems to come from far away. Once the Hawk has disappeared the volume again increases. The Grosbeak is a very clever ventriloquist, and its singing does not betray the location of its nest.

The Grosbeak is one of nature's gardeners. As every gardener knows, pruning is required to maintain healthy trees with lots of fruit. The Grosbeak acts as a pruner of the forest. By its nipping off of the buds of trees, larger seeds are produced, and in no way are the trees injured from this pruning.

When a camera, even though camouflaged, is placed near a Grosbeak's nest, the birds are shy of it for some time, the length of which depends upon how gradually the camera is moved to within shooting distance. In most species the male drives the frightened female to the nest, scolding her vociferously if she does not comply with his urgings by returning to her housekeeping immediately. Not so the male Rose-breast, however; for by means of his own example he restores his mate's confidence that all is well. He himself feeds the young, if such are present, all the while calling to his more timid mate and explaining to her that nothing will hurt her. He is truly an exemplary spouse.

BLACK AND WHITE WARBLER

Photographs and Notes by W. V. CRICH

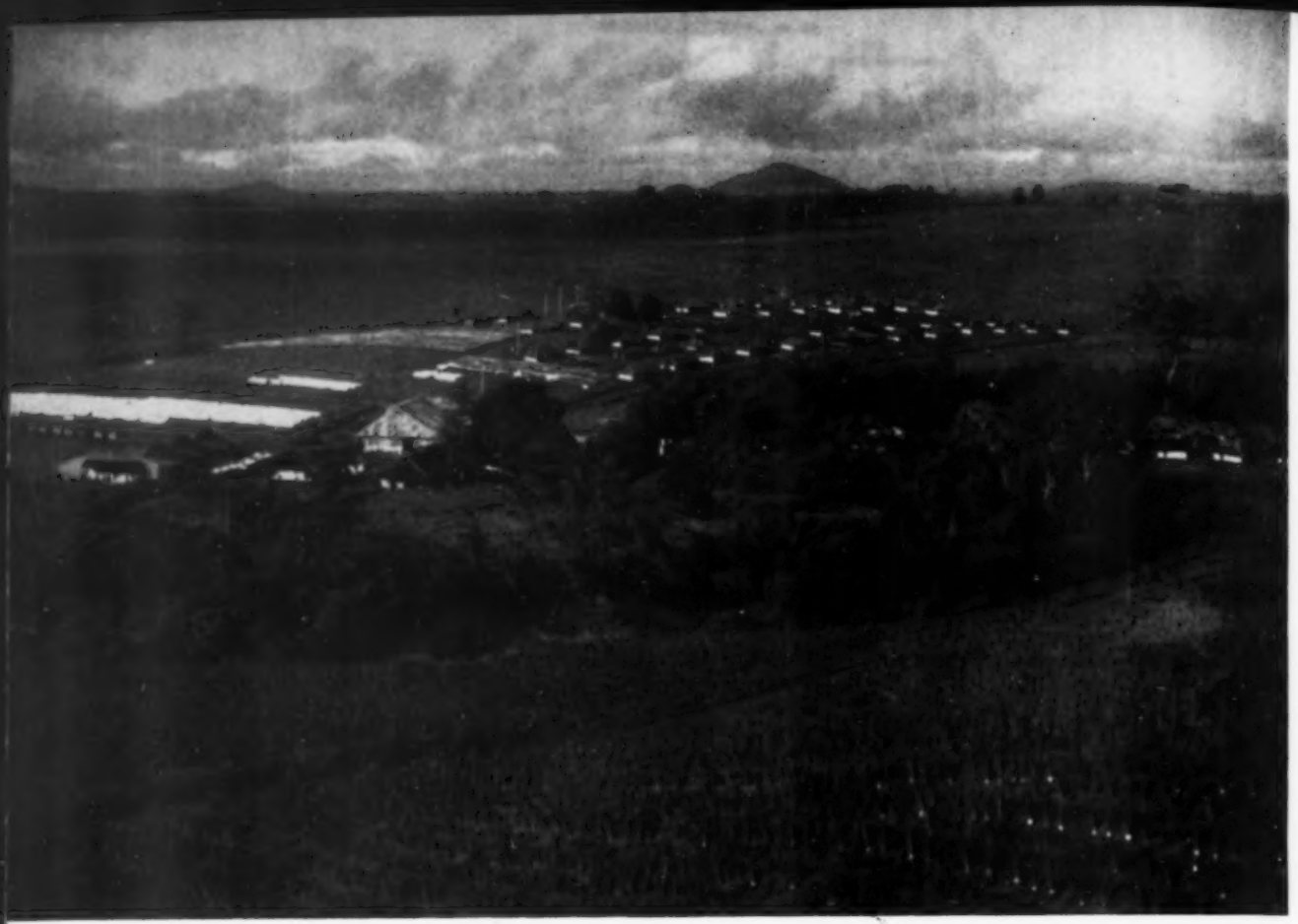
MNIOTILTA VARIA **(Gk. *mnion* moss + *tillein* to pull out; Lat. *varia* variegated)**

THE Black and White Warbler, found creeping along the trunks of trees searching for insects and larvae, is striped lengthwise with black and white.

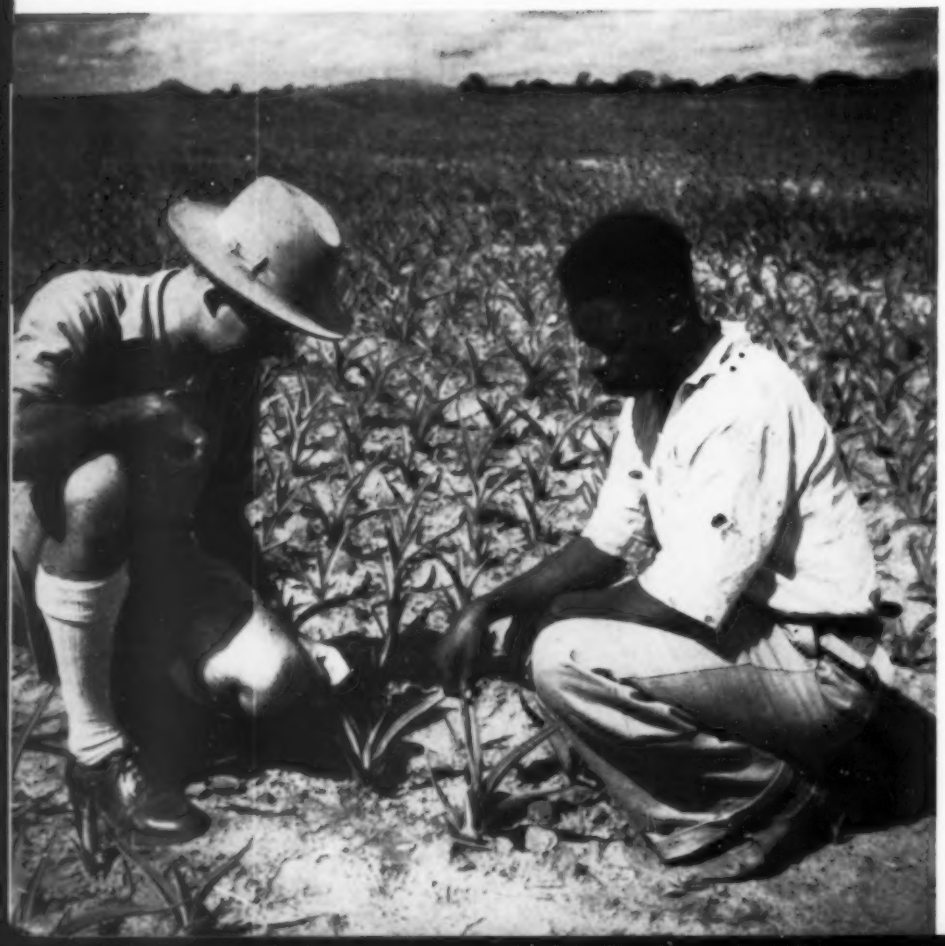
It breeds from central western District of Mackenzie, northern Ontario, New Brunswick, Nova Scotia and Newfoundland to eastern Texas, Louisiana, central Alabama, and northern Georgia, and as far west as south Dakota. The winter months it spends in Mexico, Venezuela, Florida, and the West Indies.

When entering a swampy wood on July 1st, I heard the alarm note of a small bird. This turned out to be a Canada Warbler, but its nest or young could not be discovered. Farther over to my right I heard the cry of young birds being fed. Following up the sound, I saw a large young Cowbird, almost fully feathered, being fed by a little Black and White Warbler. Poor little bird! It was kept so busy that it must have been worn out by the end of the day. I was about to pass by,

when I saw another pair of Black and White Warblers showing signs of great distress. I sat on a fallen log to watch them, and remained as still as the mosquitoes would permit. After they had been fussing around with food in their beaks for about an hour, one of them came creeping down the trunk of a tree right to the base, dropped to the ground, remained just a moment, then flew away. Through my binoculars, I could discern the wide-open mouths of baby birds. I hurried over, and there in the dead leaves on the ground at the base of the tree was a small nest full to overflowing with three young Black and White Warblers and one Cowbird. The nest was made of grasses and rootlets and roofed over and lined with finer materials. The camera was set up and I retired to a log to await the return of the parents. I had not long to wait. The parent birds came creeping nervously headfirst down the trunk of the tree. The Cowbird, which was larger than the young warblers, could reach the farthest with his long neck, and pushed and shoved to get more than his share. If he had succeeded, the young Black and White Warblers would have starved to death. But these were not warblers of ordinary intelligence; one of the warblers held an insect in its beak over the top of the Cowbird while the other warbler came in from the side and fed its own young—a clever manoeuvre. Having secured the picture I wanted, I removed and despatched the Cowbird. My good deed for the day being done, I left the little family alone, and went to look for other photographic trophies.



A typical sisal estate in Tanganyika. To the left may be seen the gleaming decorticated sisal drying on wires. The white-walled houses are the homes of the workers.



Left:—A sisal grower and his African assistant examine newly planted bulbils in an estate nursery. These will be replanted in fields after nine to twelve months' growth.

Sisal Production in East Africa

by J. D. KRIVINE

After the plant has flowered, which happens only once, this cluster of bulbils is formed at the end of short lateral branches on the flowering stalk or "pole". See p. 31.

SISAL-HEMP, product of *Agave rigida sisalana*, is a hard fibre; over fifty per cent of the entire world supply is used to make binder twine, chiefly necessary for the harvesting of wheat. But it has other uses. Apart from the old established manufacture of ropes, carpets and sacks, a post-war report of the Tanganyika Agricultural Department notes the employment of sisal in "plastic, plaster and concrete reinforcement, netting, meat scrim, filters in air brake systems, gland packings, upholstery paddings, fabrics . . ." It can be applied to the reinforcement of waterproof and insect-proof roofing in tropical countries and even to the manufacture of tires for the heaviest agricultural tractors and aircraft.

The single bulbil which is planted.

Before World War II Canada imported the bulk of her sisal from the United States. During the war, when American exports decreased abruptly, Canada was able to obtain the supplies she needed by substantially raising her imports from both Mexico and the British Colonies in East Africa. In 1938, British East Africa provided Canada with only 1,927 tons of sisal. During the war years that figure more than doubled, reaching in 1942 some 11,830 tons, or a third of Canada's total sisal imports.

World ouput of hard fibres in the pre-war days was divided roughly equally between Manilla hemp (produced mainly in the Philippines) and sisal proper. Nearly half this sisal was grown in British East Africa, whose average production for 1937-9 was 125,000 tons. British East African production thus constituted nearly a quarter of the world output of hard fibres.

British Official Photographs

A field of young sisal planted out in single rows.

The immature sisal is weeded by women and old men. These women are members of the Wamawia tribes who have migrated from Portuguese East Africa (Mozambique) to work in the sisal fields.

The war played havoc with these figures. In 1941, with no European market, fibre production was excessive. Producers in East Africa undertook to reduce their crop to 100,000 tons, which the British Government later agreed to purchase. Then with the Japanese capture of the Philippines, this "surplus" commodity promptly became a "scarce" one. Maximum production became vitally necessary and a new epoch began for the East African sisal industry.

Prices had fallen sharply in the depression years of the 30's, and in the whole period 1930-5 were below costs of production. Hence the housing and welfare amenities for sisal labourers in Tanganyika were slow in developing. There was, moreover, redoubtable competition from the more highly capitalized Netherlands East Indies industry. In 1937, when prices were rising again, there was a keen revival of activity. A Sisal Growers' Association was formed in Tanganyika which, with the assistance of government grants, established a research station at Mlingano (near Tanga) in 1934.

After between three and four years' growth the first cutting takes place. An average of fourteen leaves are left on the plant after cutting. The next cutting takes place twelve to fifteen months later.

This station co-operated with the Linen Industry Research Station at Lambeg in Northern Ireland—a territory that provides one of East African sisal's best customers. The Association now runs its own labour bureau to engage native workers.

The geographical history of sisal is interesting. The first plantation was in Yucatan, Mexico, and a regular industry for the use and exploitation of the leaf-fibre is believed to have been set up by the local Toltec Indians well before the middle of the eleventh century. The plant was then called "henequen". It owes its present name to the American Consul who, in the 1830's tried to introduce it into Florida and called it by the name of the Yucatan port, Sisal, through which it was shipped.

It spread to the Bahamas, but its cultivation there was not very successful. Nor did it flourish on the mainland in Florida or in other parts of the United States. In 1893, the Germans took 62 sisal plants to what was then German East Africa, where they thrived. Those 62 plants have now become six hundred million.

Sisal is a difficult plant to cultivate and needs a lot of capital equipment. The fibre strands come from the long spiky leaves, which contain about a thousand strands each. These are extracted by passing the leaves through a decorticator, which scrapes the softer parts from the leaf fibres. As 100 tons of leaves yield only 2½ to 3 tons of fibres, miles of narrow-gauge railways have to be built to link the fields to the factories. It is estimated that in 1939 one unit of machinery for an estate cost £30,000. Hence sisal is a plantation crop—unlike cocoa or palm oil in West Africa, which can be produced on individual small plots. Before the war the largest sisal plantation in Tanganyika ran to more than 45,000 acres.

The East African sisal plant lives for five to nine years, though some varieties live for 60 years or more. The rather familiar cultivated variety often seen in America and

Sisal poles. After five to nine years (depending on the spacing in the fields) the plant sends up its tall flowering stalk and then dies.

As the time for cutting approaches narrow gauge rails are laid down alongside the fields to be cut.

Small steam or diesel engines pull the trollies to the factory.

Europe, *Agave americana*, is commonly called the century plant. At the end of its life a tall efflorescent stem or "pole" shoots up to a height of 15 or 20 feet. On this flowering stalk bulbils (small axillary buds) and occasionally seed pods form. After flowering, the main plant dies, but is renewed by

As the fibre comes out of the decorticator it is washed in tanks to ensure thorough cleansing.

After decortication the washed fibre is hung in the sun.

pull the trollies filled with leaf to the estate factory.

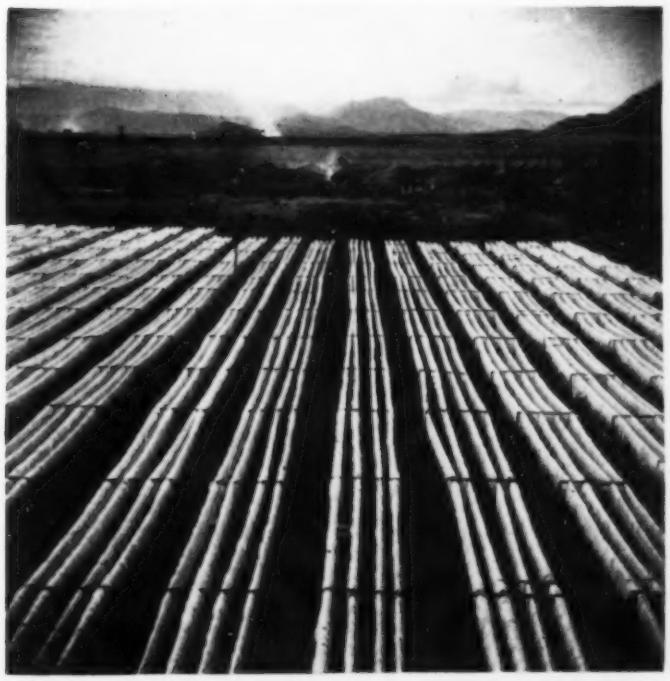
The sisal is unloaded from the trollies and placed on a revolving belt which takes it up to the decorticator.

suckers springing from the base of the stem or from the "pole" plants.

Now that World War II is over the industry is expanding further. Research, much of it in Britain, where the University of Leeds works in close conjunction with East African Research Stations (Thika, for ex-

ed fibre is hung over wires to dry and bleach in the sun.

Long rows of drying fibre. Provided conditions are favourable the fibre is dried in twelve hours.



The dried fibre is carried in from the fields to the brushing sheds.

ample, in Kenya), has concentrated on the use of the waste material in sisal. Sisal flesh (as opposed to the fibre, which constitutes only three per cent of the plant) can now provide wax and pectates used in the making of jellies and gelatinous substances required not only in the food industry, but also in the manufacture of cosmetic and pharmaceutical products. Glucose is another product; and the sisal residue can be used as plastic mould.

World production is still, owing to the reduced output in the Philippines and the Netherlands East Indies, some 125,000 tons short of the pre-war figure of 534,000 tons. East African production in consequence rose by 1944 to 140,000 tons. The price, too, has risen by agreement with Britain's Board of Trade to £63 a ton in April, 1946 and in May 1947, to £83. Before the war Britain consumed about 25 per cent of East African production. During the war her demand doubled, and she supplied sisal in reverse lease-lend to the United States, together with free or cost price deliveries to other countries—Russia, India, Australia, and the Union of South Africa. Today the whole crop is still bulk-purchased by the British Government. The consequent steadiness and adequacy of controlled price enables the industry to equip itself more efficiently. Living standards for the native workers are being improved. A levy is now raised in Kenya and Tanganyika of £2.10s. a ton on all sisal sold, to be spent on improved housing and welfare amenities on the estates.

The tow removed by the brush machine is separated by hand and hanks of fibre which have escaped the beaters are removed. The tow is baled as a separate product.

In the brushing shed the fibre brought in from the drying fields is placed in brushing machines. These consist of a rotating drum with beaters attached, which remove the dust and tow. The fibre is then baled ready for export.

Observing the Wapiti

by ALBERT POTVIN

THE BRAZEAU Game Preserve, corralled between the Brazeau and Pembina Rivers in west central Alberta, is one of the best known elk* territories in America. Old-timers and Indians of this region declare that forty years ago elk were extremely scarce. The land was ravaged by fire around the turn of the century and this greatly altered the cover; open stands of poplars and alders, where the scarred logs of evergreens had rotted away, provided suitable grazing land for the elk and they moved in from the foothills. Within the reserve, alluvial flats that support a heavy growth of hay are spaced along the water courses and provide an excellent winter range for the herds. In the Brazeau Reserve you will seldom meet any large herds except during the winter. In summer they disband or break into smaller groups that scatter over the range. Two or three groups and a score of lone animals will patronize the same wallow. In the late fall, however, especially if the summer rains have been scanty, most of the mud holes dry up and these wallows lose their popularity. The animals then

*Elk or wapiti (*Cervus canadensis*)

At top:—Majestic elk in the Athabaska Valley, Alberta

C.N.R. photo

move on towards the larger streams.

As an official of the Alberta Forest Service stationed in the heart of this region I had an unusual opportunity to observe the *modus vivendi* of the elk. I became an enthusiast in studying these big beasts, spending many chilly hours in the process. There is a mud wallow and salt lick not far from the lookout tower where, during the fly and mosquito season, not an evening goes by without a dozen animals—elk, moose, deer, bears and coyotes—coming in to drink and to plaster mud on their legs, which have been irritated by insect bites.

Early morning and evening usually found me by my observation post; I built a shelf, reasonably comfortable and screened by foliage, high up in the crotch of a birch tree, from which I could watch the animals with the minimum risk of detection. From this vantage point I have seen moose and deer calmly approach within a few rods, noisily sucking their muddy drink and completely unaware of my presence. But not so the cautious elk. They would circle the wallow in a broad arc, approach it from one direction, back-track and detour to the opposite side, stop, look, listen, test the wind, and so complete the entire circuit before, apparently satisfied that the coast was clear, they would enter the wallow from the open side where the mossy turf deadened their footfalls. When elk approached in parties they invariably halted at a safe distance and sent out a scout to reconnoitre.

One beautiful, warm evening the sun was just dipping behind the jagged line of mountains on the horizon when I visited the wallow. As I climbed up my lookout tree a magpie inconsiderately began advertising my presence. In a little while, like the soft swishing of skirts, there came the unmistakable sound of an animal shuffling through the grass. Whatever it was, it stopped before coming in sight beyond the edge of a bluff. The caution this visitor displayed suggested it was an elk. It had obviously heeded the magpie's warning.

The last glow of light died in the west and the bird without honour stopped its cackling. The moon rose and the stage was lit. A long half-hour passed and nothing stirred; I knew then that this furtive animal had kept its position. Presently a lone cloud drifted across the sky and the moving shadow spread over the wallow. Only then did the shy beast risk the open and step from behind the trees. It was a small elk, probably a yearling cow. It paced to the nearest water pocket, sipped a few long draughts and retired behind the willows before the moon again lit up the scene.

The bugling of the male elk is certainly one of the strangest and most thrilling of wild animal calls. From a distance the sound may at first be mistaken for the howling of a wolf, as only vibrations in the higher register will carry any distance through the forest. But once you have heard an elk bellow at close range you will no longer mistake it. Their bugling—and the term is apt—is sounded in arpeggio style. The first note is low and throaty; then it suddenly shifts to a squealing howl. This is maintained for a second or two, then drops in a musical, gurgling run rich in overtones; as unusual and pleasing a sound as you will hear from any woodland creature. After this theme is sounded elk may voice a rapid staccato of yelps, shifting their breath al-

A group of cow elk and their consort
National Parks Service photo

An elk calf

ternately in and out. This sequel is purely *ad lib.* and is sometimes erroneously called their bark.

The first calls roll over the valleys and hills of the Brazeau Reserve at the beginning of autumn, when the early frosts give the leaves a tint of yellow. By mid-September the trumpeting reaches a fortissimo, every male blaring his battle cry, and the strange concert keeps on until the last leaf has been blown from the aspen. Then the bugling wanes rapidly. A few bulls still full of virile ardour will continue to bawl their war-whoop until the coming of November snows.

The males seldom bother about rest during this active season but exhaust themselves in their wild runs and battles. Sometimes, as if by common consent, they will remain silent throughout an entire day, and travel as you will, you cannot catch a sound from them. Probably the weather is the reason for these strange periods of silence. After one of the snow flurries that bleach the woods of Alberta during the fall months their bugling is repeated with particular determination. They bellow through the night, and it is a weird experience indeed to hear this call in a nocturnal setting.

Knowing that hunters lure elk by imitating their bugling, after a few vocal calisthenics I went out one day to try my skill. The call was answered in good faith; from the distance came the familiar *moo-hee-ooawrr* of a bull. Pleased at this recognition I repeated the call and again came the reply from up the hill. We kept up these antiphonies for a while then the bugling stopped. For my part the little game was over but the elk had not been joking. Suddenly crashing through the brush, it appeared in the open. My next move should have been to run for the nearest tree but I stood too dumbfounded to move and completely at the mercy of this big bull. It was so close I could read its face: "So! That's the little imposter!" and with an elkish sneer the brute turned back into the woods.

In the mating season elk bulls will attack each other whenever they meet. They bellow more insistently during the cool morning and late evening hours but will fight during the heat of the day or even by moonlight. Without arranging battle schedules they are nevertheless good tacticians. The one who opens the challenge usually selects the battle position. Where combats have been fought the ground is torn up and the alder brush flattened down. This evidence is most frequently found on the crest

A mature bull wapiti has branching antlers which rise slantingly four feet or more above his head.

of a knoll or high ground overlooking the surrounding exposures. An avenue of escape is thus provided as well as the advantage of elevation from which to meet a contender bold enough to answer the call.

The prelude to an elk fight is theatrical. One September evening, two bull elk began taunting each other about half a mile north of the tower hill where I stayed. I grabbed my flashlight and hurried to the ring. The last two hundred yards had to be covered with great caution. A light breeze was blowing in my favour but it would have been imprudent to underrate the watchfulness of the animals. I crawled very carefully on my hands and knees and in this manner came to within twenty paces of the one that had bugled his challenge. If there were any cows about they did not disclose their presence. I stretched out flat behind a screen of alder brush and waited for the *dénouement*.

It was dusk now but the big form stood plainly defiant, pacing about in the clearing ahead. It would stare intently in the direction from which the other one was approaching, then suddenly turning about, would scan the rear. Each time it raised its head to bugle out a threat to the approaching bull a shiver ran down my back. To have a big elk bugle into your ears is a thrill in the superlative. At that range it towers over you like an elephant; its shaggy neck distended, its antlers thrown back, legs poised for any move, it is the incarnate picture of vigour.

The second elk was taking its own good time about appearing. It answered every call promptly and boldly, occasionally uttering a few short yelps for good measure, but it was advancing cautiously, evidently suspecting an ambush. Then the bugling ceased and for a long tense moment only the rustling of the leaves disturbed the silence; the challenger in the clearing remained rigid, with eyes fixed. I raised my head timidly, and there, fifty yards away but not where I had expected to see it, stood the second elk.

The evening light was waning now and this bull stopped in the shadows, but its head, crowned with a magnificent set of antlers, showed in relief against the background of a spruce tree. The two animals stood facing each other with only a little space separating them. Contrary to stories of their dashing fiercely at each other on sight, neither made any immediate move to attack. Presently the challenger, lowering its head, began snorting in bovine fashion, then squealed like a pig. The other made no sound but advanced slowly, taking one pace to the right then one to the left. It came on with calm assurance, giving no sign of nervousness and obviously scorning the other's tantrums.

Suddenly, the first elk wheeled about, looked directly at the spot where I lay hidden, gave a loud yelp, kicked its heels and bolted into the brush. The second bull about-faced and stalked off in all dignity. What caused the alarm I shall never know.

In winter the bulls share the social life of the herd.

National Parks Service photos

At top:—The well kept flower garden of the Royal Botanical Gardens at Peradeniya, Ceylon. The two tall needle palms on the right seem to tower above Hantane Hill in the background.

Left:—The small lily pond. Tree-tops above the palms are Dichopsis pustulata *(from which gutta-percha is obtained) planted in 1882, in the branches of which are suspended many flying-foxes (nocturnal, fruit-eating bats).*

Top right:—Entrance to the gardens during the time of military occupation as Allied Headquarters.

The Royal Botanical Gardens, Ceylon

by J. R. T. RICHARDSON

Photographs by the author

THE 150 acres of the Royal Botanical Gardens at Peradeniya, near Kandy, excel the rest of Ceylon, that island of trees, in the beauty of their tropical vegetation. Second only to Kew Gardens in the Commonwealth, both for fame and importance, they possess the finest array of trees and plants in the tropical world, although the Dutch have a somewhat larger collection at Buitenzorg, Java. When the authorities chose this site for the headquarters of the Supreme Commander, South East Asia, many thousands of Allied service men and women worked in and were able to enjoy a beauty spot which most of them would otherwise never have seen.

The worth and fame of these Gardens are, however, measured less in terms of beauty, than by the extent of the valuable botanical and agricultural knowledge which has spread from them to many countries in the world besides Ceylon. Nobody in the Island denies that Peradeniya Gardens have been directly responsible for much of Ceylon's commercial and agricultural wealth, now greater than ever before. For over 120 years the story of the Gardens has been one of steady progress under the guidance of a succession of able and enthusiastic directors, who made of them a horticultural and scientific centre respected throughout the botanical world.

Instances of help given to growers, and contributions to botanical science are innumerable. The cultivation of tea, cloves, and nutmeg, to name a few, has been assisted and improved by the introduction of good strains cultivated at Peradeniya. Between 1850 and 1890 many new horticultural

In gathering this information, the author wishes to acknowledge the kindness and co-operation of Mr. T. H. Parsons, O.B.E., Curator of the Peradeniya Gardens until 1946. Mr. Parsons, in 32 years of service, was largely responsible for perfecting the Gardens, in which, during the war, he did important work on balsa cultivation.

Left:—The royal palm avenue (Oreodoxa regia) *planted in 1898.*

Below:—A clump of Burmese giant bamboo (Dendrocalamus giganteus) *grown from a shoot from the Calcutta Botanical Gardens. There are 406 stems in the clump whose girth is 193 feet and height 100 feet. The largest stem is 9½ inches in diameter.*

Trimming the grass in the gardens. The cutting is done with wooden swords. The bullock team, while not speedy, is steady and reliable. In the background is the palmyra avenue.

Right:—The palmyra avenue (Borassus flabellifer) *planted in 1887.*

Ribbon border of red and yellow coleus. The coleus grow in six months from cuttings and strike rapidly.

Part of the palmetum. Plant in foreground, Ptychosperma macarthuri, *of Australian origin was planted in 1915.*

specimens were introduced, including cacao, cinchona, vanilla, and new fruits and flowers. The success of rubber was helped when, in 1894, the Government started plantations in Ceylon; the first "budded" rubber experiments were made in the Botanical Gardens and success assured. Today there are 600,000 acres under rubber in the

Avenue of Talipot palms (Corypha umbraculifera) *planted* [illegible] *each hole, the two weakest seedlings removed.* [illegible]*trees are* [illegible] *The Talipot palm flowers only once and after it is huge in*

The economic nursery garden. Here balsa, grasses, plants for the production of fibres, oil, etc., are cultivated.

Island. Up to a million seeds of the tree have been produced in a single year at Peradeniya.

Before the war the demand for plants, seeds, information and advice was world wide. India in particular was an interested customer. The Gardens were visited by thousands from other countries, many of

Talipot palms thirty-nine years old. These trees, which are 80 feet high, can soon be expected to flower and die.

mbraculifera) *planted in 1927. Three seeds are planted in* removed *trees are 30 feet apart with 50 feet between rows.* nd after *huge inflorescence and ripening of fruit it dies.*

A row of Java almonds (Canarium commune). *Wide-spreading, relatively thin buttresses help to support the otherwise cylindrical silver-grey bole of these trees.*

whom were keen to see the economic nurseries and to study the latest methods of cultivation at first hand. The world war did not fully curtail this interest, for letters were still received at a rate of 5,000 a year—all of which were answered. This indicated a continued eagerness to take advantage of Peradeniya's generous service, which is put at the world's disposal by the Ceylon Department of Agriculture.

It was feared that military occupation of the Gardens, which began in 1942, would cause a marked deterioration of the flora, as well as permanent injury to the amenities. Happily this has not taken place. In the construction of nearly 200 buildings and hutments, it was inevitable that damage and destruction should be caused as lorries manoeuvred among shrubs and trees. Casualties, however, do not amount to more than forty trees, which can be replaced.

Behind the two Java almond trees can be seen palmyra and cabbage palms.

On the credit side was the widening by the military of many of the roads.

A walk round the paths now that the troops have gone shows buildings of more or less temporary nature concentrated in three of the four main sections of the Gardens. Only the South Garden escaped "occupation". In this part, such features as the Lake, the Pinetum and Palmetum, the magnificent Talipot Palm Avenue, and the Herbaceous Garden retain their pre-war appearance completely. The same can be said of the Spices Collection, the Cabbage Palm and Palmyra Avenues, Flower Garden, and other features elsewhere. Peradeniya provides a sharp contrast with the neglect by the Japanese of the Singapore Botanical Gardens.

Of actual new experimental work during the past five years, interest has centred mainly around the balsa tree and the Hibiscus flower. Growing the light balsa wood was vital war work owing to the greatly stimulated demand for it in aircraft production. In order to study the characteristics of this specialized tree, the Curator planted experimental plots on the banks of the Mahaweli Ganga each October for four years, on a day that became known as "Balsa Day". As to the cultivation of *Hibiscus rosa-sinensis* (the indigenous shoe-flower), a collection of lifesize watercolours made by one of the resident draughtsmen bears eloquent testimony to the many exquisite new varieties which have been evolved. Attention is now being turned to dahlias, but work has been handicapped by the absence of a Systematic Botanist for the carrying out of experimental work.

A giant yellow-flowered orchid growing on a Brazilian cottonwood tree.

The cannon ball tree (Couroupita guianensis) *of South America. The man is holding one of the beautiful pink flowers.*

Clump of giant bamboo growing on the bank of the Mahaweli Ganga. During the June-July monsoon the bamboo grows as fast as twelve inches a day.

Peradeniya's crowning glory is her trees. Whether standing alone or in avenues they are seen to best advantage in the Gardens, where a policy of maintaining open vistas has always been practised. One cannot help being impressed by these magnificent trees on the gently undulating site, encompassed by the Mahaweli Ganga, the longest river in Ceylon, and set against a beautiful mountain background. The warm, equable climate and an annual rainfall of 90 inches are the main causes of their abundant growth.

A list of individual trees worthy of mention would be a long one. Four, however, are particularly impressive. They are the giant mango in the Arboretum, which was probably growing there in 1821 when the Gardens were commenced; a *Ficus benjamina* with a low umbrella spread of 150 feet from tip to tip; the lovely Eugenia (*Syzygium*) whose shapely branches, soft grey bark, and pretty rose and green leaves are an unforgettable sight in a Ceylon sunset; and finally the Cook's pines (*Araucaria cookii*) from New Caledonia of which the tallest of three or four in the gardens, not yet fully grown, rises in a single straight stem 170 feet high. It is almost certainly the highest tree in Ceylon.

Of all the great avenues at Peradeniya, one of the finest is that of the Talipot palms (*Corypha umbraculifera*), now 19 years old and in fine condition. Both lines of these amazing palms are wonderfully uniform.

The future of the Gardens is always under consideration. Plans for improvements are in existence, but the first task is to remove the traces of military occupation. Then a cricket pitch is to replace the road junction known as the Great Circle. (Cricket is Ceylon's national game.) The proposed pitch is likely to be the finest in the Island, the shady ground surrounding it forming a delightful natural grandstand. The north

Part of the cactus collection. Beside the man is an 18-foot Cereus.

Inside the main entrance to the gardens. Guide's lodge on right behind bed of cannas. Beyond the gate is a mahogany tree (Swietenia Mahogani).

section of the Gardens will be improved by a new and more gracefully curving road. Landscape and road work are to be carried out in the Arboretum. Near here too, a modern summer house will replace the old one on the bank of the Mahaweli Ganga; this spot, with its clean white sands at the water's edge and its fine river views, has always been a popular haunt with visitors. The roads widened by the army are to be still further improved by a four-foot grass verge and a border of plants.

The work of returning the Gardens to their pre-war glory has been hindered by the destructive flooding of the Mahaweli Ganga in the Kandy district in August 1947, which caused extensive damage in Peradeniya.

Identity label stones require constant repainting by the Sinhalese worker.

EDITOR'S NOTE-BOOK

Douglas Leechman, Ph.D., M.A., B.Sc., was born in London and was educated in England, Egypt and Switzerland. After service in World War I he attended the University of Washington where he took courses in anthropology. Dr. Leechman is archaeologist of the National Museum of Canada, having been in the Division of Anthropology of the Museum for more than twenty years. His archaeological field trips have taken him to the eastern Arctic, the central prairies and the Yukon. Dr. Leechman is a frequent contributor to Canadian periodicals and the author of *The Hiker's Handbook* and *Eskimo Summer*.

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W. V. Crich of Toronto is by profession a school teacher, but for many years his avocation has been the study of birds. With infinite patience he has photographed all phases of bird life in the southern Ontario area and his deep interest in natural history has led to fine camera studies of animals and flowers as well as the rural scene. Mr. Crich's photographs have appeared in Canadian periodicals and books; one of the recent volumes containing examples of his work is Malcolm MacDonald's *The Birds of Brewery Creek*.

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Albert Potvin was educated in Edmonton, and was for a time an official of the Alberta Forest Service. At present he is with the Dominion Forest Service, Department of Mines and Resources, Ottawa. He is a frequent contributor of nature articles to many Canadian periodicals.

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John R. T. Richardson was born in London and early developed a taste for travel and photography while organizing cycling tours to the mountainous districts of Europe. He spent the war years in the R.A.F., working in the photographic and intelligence branches and in association with the R.C.A.F. in Normandy. After VE day, Squadron Leader Richardson was posted to South East Asia Command with headquarters in Ceylon. During this period he met Mr. T. H. Parsons, then curator of the Peradeniya Gardens, and became interested in the story of their development. His article gives a brief survey of them after the war. After further service in Malaya and Australia he returned to England, was demobilized in August, 1947, and is now a professional photographer in London.

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HOW SCIENTIFIC NAMES ASSIST IN BIRD IDENTIFICATION

by W. V. Crich

Scientific names are a necessity for international scientific intercourse. For example, our flicker has 47 common names here in Canada and the United States of America. A person in an area where it is called the flicker may not know at all what bird is referred to, if in another area it is called the highholder.

While some of the scientific names of genera and species are doubtless rather fanciful and inappropriate, nevertheless most of them help greatly in identification, especially when the scientific terms denote colours or marking. For example:—*Ceophloeus pileatus abieticola*. *Keiein*-Gr. to cleave + *phloios* bark; *pileatus*—Lat. capped; *abies*, fir; *colere*, to dwell. In other words, "The capped fir dweller that clings to the bark". This is an appropriate and suggestive description of the pileated woodpecker.

The scientific name of a bird consists of three parts. The first term is the genus to which it belongs; the second term is that of the species, and the third term is the name of the subspecies. When a species is divided into subspecies, the form which was first named in this species is automatically given precedence, and its subspecific name is a mere repetition of its scientific name. Thus, the first bird classified in genus *Junco* and species *hyemalis* was the Eastern Junco which was then given the scientific name of *Junco hyemalis*. When the Carolina Junco was added in this genus as a subspecies and given the scientific name *Junco hyemalis carolinensis*, the original Eastern Junco became known scientifically as *Junco hyemalis hyemalis*.

AMONGST THE NEW BOOKS

The Algonquin Story
by AUDREY SAUNDERS
(Ontario Department of Lands and Forests, Toronto, $2.00)

There are two kinds of historian, the quick and the dead. The latter, poking about the mummies of the past, are dry as the dust they raise in the cerements. But the others see history whole: they observe how the stream flowing out of the past gives nourishment to the present and promise of the future. Miss Audrey Saunders with her first published work has firmly placed herself with the forward-looking group.

The Algonquin Story is a tale of pioneering, and it has caught the pioneer spirit better than any book I have read in years. I found myself absorbed, then genuinely excited, as her tale of the Algonquin Park region led from the early explorers to the fur-traders, the fur-traders to the timbermen, and in the wake of the timbermen the hardy settlers. These are successive waves, natural, inevitable. The men themselves are robust and alive, real men to whom hardship is normal and courage a daily requirement. You feel that you know these men and their problems, feel the impact of the northland upon them, and through them you come to know the country too.

To bring individuals so fully and vividly to life in a matter of a few lines, to make them live not only as individuals but as epitomes of their kind, and to make clear through them the continuate growth of their fragment of history—this is a rare achievement, involving writing of the first order. Very early in her work Miss Saunders must have determined to write the story of the *people* in the area, and thereafter held unswervingly to that goal.

The urgency and freshness of this volume spring in part from the conditions under which it was written. The author has drawn the greater part of her material from original sources, having spent nearly a year during 1944-45 recording the memories of men, and of sons and grandsons of men, who were pioneers in the region. Several trips were made under severe winter conditions to gather material that might otherwise be lost forever, and already at least half a dozen of the author's informants have joined their fellow pioneers. That their story was recorded in time is due laregly to the initiative of Mr. Frank A. MacDougall, veteran bush pilot who was supervisor of Algonquin Provincial Park for ten years and has been Deputy Minister of Lands and Forests for Ontario since 1942. Interesting certain authorities in his idea of preparing such a history, he was instrumental in commissioning Miss Saunders for the task, and she was given every aid by the Department in collecting her material.

The founding of Algonquin Park and the entire record of its subsequent administration is a story of continual accomplishment. Too often the hustings denigrate government until we forget the valuable work going on quietly and efficiently behind the political facade. It is heartening to read here of solid achievement wrought by the foresight and wisdom of public servants. The Algonquin Park Act was passed in 1893, eight years after Alexander Kirkwood, a clerk in the Ontario Department of Crown Lands, first suggested setting aside "the headwaters and tributaries of the Muskoka, Petawawa, Bonnechère and Madawaska Rivers" in order to preserve the natural forest and the wild life in the area. Kirkwood, at the time, had never seen the region but his effort to bring his vision to reality is a romance in itself.

The duties of the Park Rangers are many and varied. Fur smuggling was one of their biggest problems in the early days. Fire prevention has always been a most important task, requiring constant vigilance, and for concentrated excitement it would be hard to beat the diary-record of three days' fire-fighting which is included. Tom Thomson's story told here reveals his human qualities as well as his passionate feeling for this northern land. But the pioneer spirit is felt too in modern developments within the Park, something different in holiday resorts and summer camps, new uses connected with scientific research and education. We look to an expanding influence by the Park on life in Canada and beyond our borders. *The Algonquin Story* will give Canadians a pride in their country and a truer appreciation of its heritage. Perhaps as important, it will lead many to set down their own canoes in northern waters.

Photographs and four coloured reproductions of Tom Thomson's paintings illustrate the book and to complete a fine presentation the volume comes in a container together with five maps of the area.

WALLACE R. JOYCE

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New Orleans Holiday
by ELEANOR EARLY
(Clarke, Irwin & Co., Toronto, $3.75)

Eleanor Early is a professional author and a good one. Her skill and experience combined enable her to produce a thoroughly competent piece of reporting, a well-written, abosrbing account of one of the most romantic of all North American cities, New Orleans. The immense amount of research she had done, the wealth of detail, are not allowed to clog the progress of the book, nor does she permit a false modesty to exclude an account of some of the less savoury parts of the town, or the less reputable items in its history. The author has had a good deal of experience as a radio commentator and she knows how to talk to people. In this book she tells you about her subject, talking rather than writing, in a style quite her own and the result is most enjoyable. Certainly nobody can read it without feeling a strong conviction that here is one more for the long lists of places that must be visited.

DOUGLAS LEECHMAN

They Live in the Sea
by DOUGLAS P. WILSON
(Collins, Toronto, $3.50)

The author of this unusual book is a professional marine zoologist who has been engaged for many years on research work at the world-famous Plymouth (England) Laboratory of the Marine Biological Association. The results of his scientific studies have been published in technical journals, but, happily, he has also occasionally written in a more popular vein, the most notable example being his *Life of the Shore and Shallow Sea*. This was published in 1935 and was acclaimed on both sides of the Atlantic as the best book ever written on the subject.

Mr. Wilson, in his work with students and amateurs alike felt that there was a dearth of books dealing with marine natural history in a non-technical manner. He accordingly set himself the congenial task of the filling of this gap on the bookshelf of the amateur naturalist, in the hope, also, of tempting into a delightful new field of knowledge many young folk who might otherwise miss it altogether.

The plates, ninety in number, are quite breath-taking. They were selected from a collection made by the author with much labour over a period of years. They are all photographs of living animals in their natural environment, on the seashore, or under water in aquarium tanks or on the stage of the microscope, often, in the case of minute organisms, greatly magnified. Many of these animals are of inconceivable beauty, resembling exquisite flowers in structure and colouring and even in their names, such as Dahlia Anemone or Oaten Pipes, and though one may be disillusioned when reading the text by a disclosure of weird structure and decidedly predatory habits, this only adds to the interest and excitement of the new knowledge.

Beginning with the comparatively simple structure of sponges, Mr. Wilson goes on to describe the more highly organised forms of marine life. The entire text, closely correlated with the pictures, reflects Mr. Wilson's abundant and accurate knowledge and is characterized by extreme lucidity and ease of style. He has provided two chapters on the methods used in procuring specimens for laboratory study, which will be very useful to naturalists who may not always succeed in "bringing 'em back alive" without his timely advice.

Mr. Wilson concludes his study by a brief but illuminating chapter on the early larval stages of marine life, illustrated by very remarkable microphotographs. For the benefit of the serious student of zoology the scientific names of the species shown in the plates are listed at the end of this very interesting and handsomely produced book. F. E. FORSEY

* * *

The Flying North
by JEAN POTTER
(Macmillan, Toronto, $3.75)

The range of this book is more limited than its title would imply, since it is confined to flying in Alaska. It is full of "tall tales", but incredible as many of them may seem, they are all true. Jean Potter spent a year and a half in Alaska, flying and talking with the men whose exploits she chronicles. From them she gathered, too, the most amazing and amusing stories of many of the earliest pilots, who, with primitive planes and often rudimentary knowledge of aviation, conquered the vast and mountainous terrain of Alaska, and, with their equally indomitable followers, gave Alaskans the reputation of the "flyingest" people in the world.

To these bush pilots no danger was too great, no errand too trifling. They were there to serve the people, miners, fishermen, explorers, lonely settlers, Indians and Eskimos, and they would undertake to carry anything in their small battered craft for Arctic or sub-Arctic life or industry. Some of their planes had been wrecked and patched, wrecked and patched many times. "Spare parts flying in formation", one pilot said of his Bellanca. Mercy flights were and are constantly required in this land of great distances and few doctors. Of this service heroic deeds are narrated by Miss Potter. Their disregard of their own safety in hazardous flying conditions, their resourcefulness and skill when human lives are in jeopardy have given these flyers a unique place in the hearts of the Alaskans. In a land where everyone travels by air, they are personages, known to everybody by their first names, the most popular people in Alaska.

From the personal albums of the pilots themselves came many of the striking photographs with which the book is illustrated. It is well indexed and supplied with clear endpaper maps. F. E. FORSEY

* * *

Roman Britain
by IAN RICHMOND
(Collins, London and Toronto, $1.35)

Roman remains in Britain hold a perennial fascination. Almost every part of the country has yielded traces, many of them in a remarkable state of preservation, of the four hundred years of the Roman occupation: "Trackway and camp and city lost, salt marsh where now is corn". To the long record of discoveries and reconstruction of buried cities by the labours of archaeologists, recent years have added intensely interesting disclosures of historic sites made visible by aerial photography, and confirmed by subsequent excavations. To quote Kipling again:

> And see you, after rain, the trace
> Of mound and ditch and wall?
> O that was a Legion's camping place
> When Caesar sailed from Gaul.

One wonders what poignant lines he might have written had he lived to know that the devastating bombings of the war years had in one dread moment uncovered sites long unsuspected even by archaeologists or where excavation had not before been possible.

Dr. Richmond has held many distinguished appointments, including the Directorship of the British School

of Rome, 1930-1932. Since 1943 he has been Reader in Romano-British Archaeology at King's College at Newcastle-upon-Tyne, and in 1944 he was appointed a Royal Commissioner for Historical Monuments in both England and Scotland. In this slender volume, we are told, not so much of archaeological discoveries, but from Dr. Richmond's study of the records, written and material, the vivid history of the centuries when Rome imposed her civilization on Britain. From the first landing in 55 B.C. until the final collapse four hundred years later, the reader gains a clear picture of the state of the country when the Romans first took over, the many warring tribes of Britons, the gradual conquest and pacification. One meets again the emperors and military commanders of our school days and the heroes of the "resistance movements" like Caractacus. Most illuminating are the chapters describing the impact of the new culture, the remarkably high standard of living among the conquerors and conquered in the later periods, the amazing developments in trade and shipping, mining, building, agriculture and in the gentler arts of architecture, pottery and jewellery, of which such splendid memorials remain to our own day.

The delightful map of Roman Britain on page 10 is indispensable in following the text. Besides giving English equivalents to Latin place-names (Did you know that Lincoln was Lindum Colonia ?) it indicates towns, townships, fortresses, forts, frontier walls and mines. There are also maps of Hadrian's Wall and the Antonine Wall which succeeded Hadrian's. Very notable Roman remains are shown in eight handsome colour plates and twenty-two illustrations in black and white.

This is another of Collins' triumphs, a book with every attraction in appearance and make-up and written by an authority on his subject in a style that immediately wins the attention and interest of the reader.

F. E. Forsey

* * *

Soviet Land
by G. D. B. Gray
(Macmillan, Toronto, $3.50)

This is a factual account of "The Country, Its People, and Their Work". It is illustrated with numerous excellent photographs, many of them not published before, and there is a wealth of first-rate diagrams and graphs, strongly and boldly drawn, which reveal at a glance far more than could be explained in many pedestrian words.

The book is concerned with such matters as the physiography, climate, soil, government, history, agriculture, industry, transportation, and settlement of the U.S.S.R. It is not concerned with politics or ideologies. As a modern reference book it is invaluable, and one that carries an air of authority and accuracy. Many of the topics discussed, especially in such fields as settlement and development of the far north, are of immediate interest to us in Canada. The rather poor presswork on the half-tones is the only weakness in an excellent book.

Douglas Leechman

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